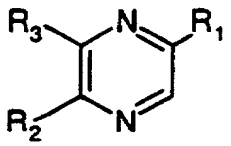
CLAIMS

1. A pharmaceutical composition comprising at least one compound of general formula:



(I)

in which

R_1 represents the stereoisomeric forms of the chain

$$-(CHOH)_3-CH_2OH \qquad (II)$$

and

either (A) R_2 represents a hydrogen atom and R_3 represents the stereoisomeric forms of the chain

$$-CH_2-(CHOH)_2-CH_2OH \qquad (III)$$

or (B) R_2 represents the stereoisomeric forms of the chains

$$-(CHOH)_3-CH_2OH \qquad (II)$$

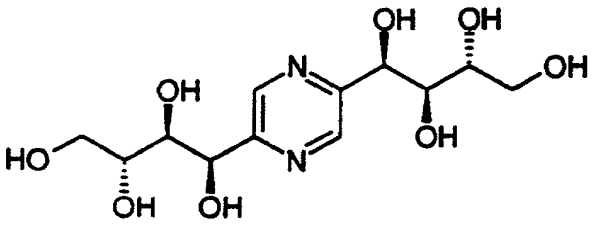
or

$$-CH_2-(CHOH)_2-CH_2OH \qquad (III)$$

and R_3 represents a hydrogen atom, or a salt thereof with an organic or inorganic acid,

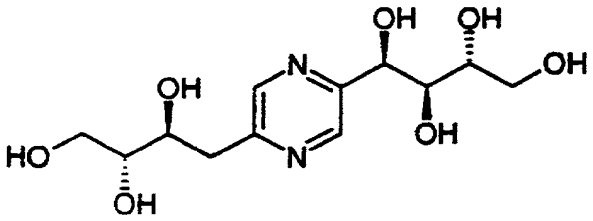
provided however, that said compound is not

- fructosazine of formula



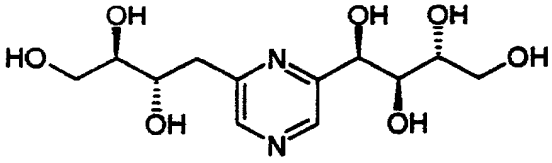
(IV),

- deoxyfructosazine of formula



(V),

- or the compound of formula



(VI)

2. A pharmaceutical composition according to claim 1 comprising a compound selected from the group consisting of:

1-[5-(1R,2R,3R,4-tetrahydroxybutyl)pyrazin-2-yl]butane-1R,2R,3R,4-tetracol

1-[5-(1R,2R,3S,4-tetrahydroxybutyl)pyrazin-2-yl]butane-1R,2R,3S,4-tetracol

1-[5-(1R,2S,3S,4-tetrahydroxybutyl)pyrazin-2-yl]butane-1R,2S,3S,4-tetracol

1-[5-(1S,2R,3R,4-tetrahydroxybutyl)pyrazin-2-yl]butane-1S,2R,3R,4-tetracol

1-[5-(1S,2R,3S,4-tetrahydroxybutyl)pyrazin-2-yl]butane-1S,2R,3S,4-tetraol

1-[5-(1S,2S,3R,4-tetrahydroxybutyl)pyrazin-2-yl]butane-1S,2S,3R,4-tetraol

1-[5-(1S,2S,3S,4-tetrahydroxybutyl)pyrazin-2-yl]butane-1S,2S,3S,4-tetraol

1-[5-(2R,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1R,2R,3R,4-tetraol

1-[5-(2R,3S,4-trihydroxybutyl)pyrazin-2-yl]butane-1R,2R,3S,4-tetraol

1-[5-(2S,3S,4-trihydroxybutyl)pyrazin-2-yl]butane-1R,2S,3S,4-tetraol

1-[5-(2R,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2R,3R,4-tetraol

1-[5-(2R,3S,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2R,3S,4-tetraol

1-[5-(2S,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2S,3R,4-tetraol

1-[5-(2S,3S,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2S,3S,4-tetraol

1-[6-(2R,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1R,2R,3R,4-tetraol

1-[6-(2R,3S,4-trihydroxybutyl)pyrazin-2-yl]butane-1R,2R,3S,4-tetraol

1-[6-(2R,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2R,3R,4-tetraol

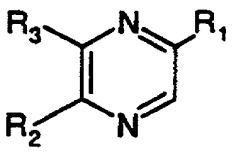
1-[6-(2R,3S,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2R,3S,4-tetraol

1-[6-(2S,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2S,3R,4-tetraol

1-[6-(2S,3S,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2S,3S,4-tetraol

or a salt of such a compound with an inorganic or organic acid.

3. A compound of formula:



(I)

in which

R_1 represents the stereoisomeric forms of the chain

$$-(CHOH)_3-CH_2OH \qquad (II)$$

and

either (A) R_2 represents a hydrogen atom and R_3 represents the stereoisomeric forms of the chain

$$-CH_2-(CHOH)_2-CH_2OH \qquad (III)$$

or (B) R_2 represents the stereoisomeric forms of the chains

$$-(CHOH)_3-CH_2OH \qquad (II)$$

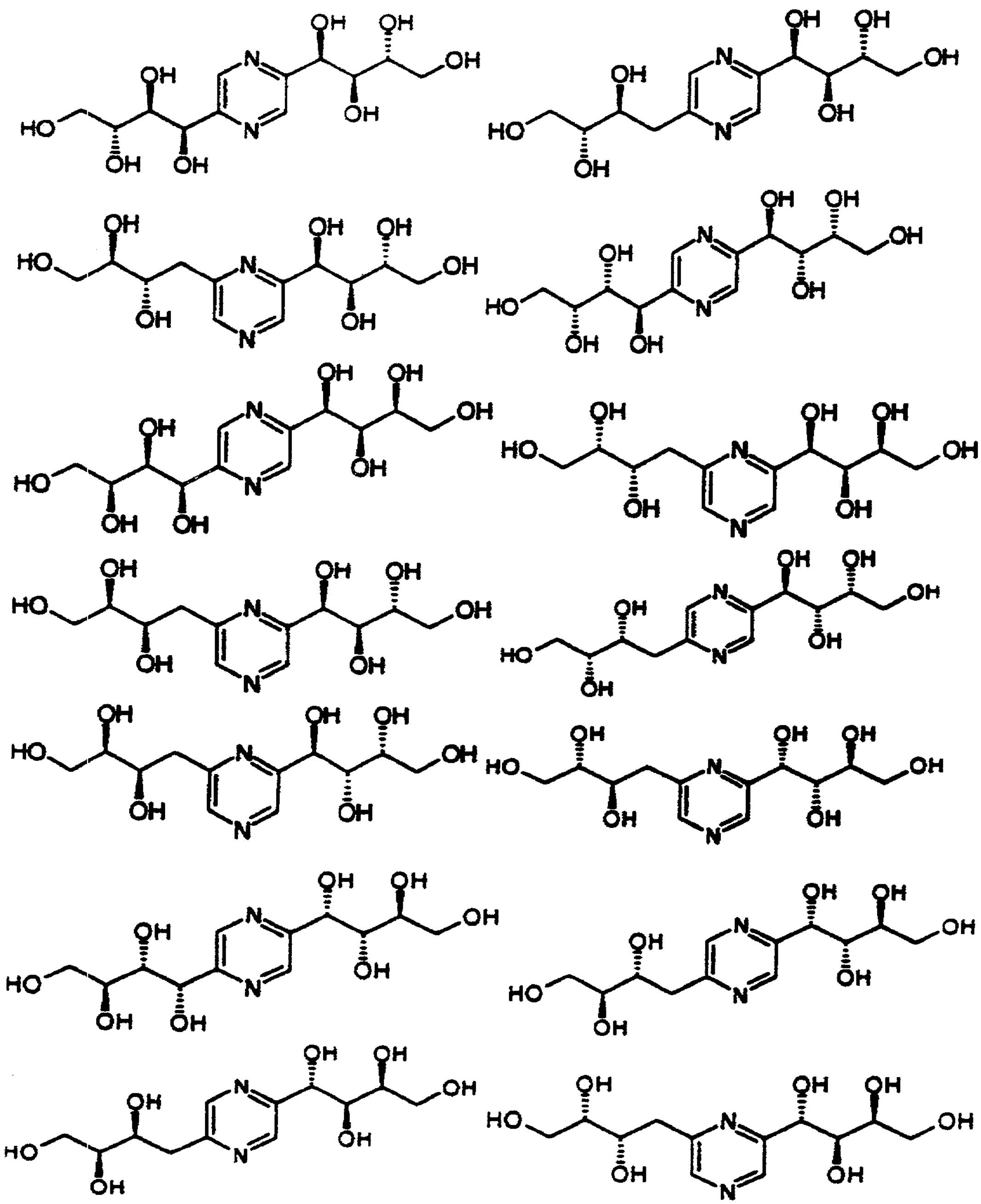
or

$$-CH_2-(CHOH)_2-CH_2OH \qquad (III)$$

and R_3 represents a hydrogen atom,

or a salt thereof with an inorganic or organic acid,

provided, however, that said compound is not a compound having any of the following structures:



4. A compound according to claim 3 selected from the group consisting of:

1-[5-(1R,2R,3S,4-tetrahydroxybutyl)pyrazin-2-yl]butane-1R,2R,3S,4-tetraol

1-[5-(1S,2R,3R,4-tetrahydroxybutyl)pyrazin-2-yl]butane-1S,2R,3R,4-tetraol

1-[5-(1S,2S,3R,4-tetrahydroxybutyl)pyrazin-2-yl]butane-1S,2S,3R,4-tetraol

1-[5-(1S,2S,3S,4-tetrahydroxybutyl)pyrazin-2-yl]butane-1S,2S,3S,4-tetraol

1-[5-(2R,3S,4-trihydroxybutyl)pyrazin-2-yl]butane-1R,2R,3S,4-tetraol

1-[5-(2S,3S,4-trihydroxybutyl)pyrazin-2-yl]butane-1R,2S,3S,4-tetraol

1-[5-(2R,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2R,3R,4-tetraol

1-[5-(2S,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2S,3R,4-tetraol

1-[6-(2R,3S,4-trihydroxybutyl)pyrazin-2-yl]butane-1R,2R,3S,4-tetraol

1-[6-(2R,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2R,3R,4-tetraol

1-[6-(2S,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2S,3R,4-tetracl

or a salt of such a compound with an inorganic or organic acid.

5. A compound according to claim 3 selected from the group consisting of:

1-[5-(2S,3S,4-trihydroxybutyl)pyrazin-2-yl]butane-1R,2S,3S,4-tetraol

1-[5-(2R,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2R,3R,4-tetraol

1-[5-(2S,3R,4-trihydroxybutyl)pyrazin-2-yl]butane-1S,2S,3R,4-tetraol

and their salts with an inorganic or organic acid.

6. A process for the preparation of a compound according to claim 3 in which R_1 of formula (I) represents the stereoisomeric forms of the $-(CHOH)_3-CH_2OH$ chain (II), R_2 represents a hydrogen atom and R_3 represents the stereoisomeric forms of the $-CH_2-(CHOH)_2-CH_2OH$ chain (III), said process comprising reacting ammonium formate with an aldose, or a mixture of two aldoses, of the dextrorotatory or levorotatory series, of general formula:

$$CHO-CHOH-R_1 \qquad (X)$$

in which R_1 has the same meaning as in claim 3, isolating the product and optionally converting it to a salt.

7. A process according to claim 6 in which the aldose is selected from D-gulose, D-galactose, D-allose, D-altrose, D-

idose, D-talose, L-glucose, L-mannose, L-galactose, L-allose, L-altrose, L-idose, L-talose and L-gulose.

8. A process for the preparation of a compound according to claim 3 in which R_1 of formula (I) represents the stereoisomeric forms of the $-(CHOH)_3-CH_2OH$ chain (II), R_2 represents the stereoisomeric forms of the $-(CHOH)_3-CH_2OH$ chains (II) and R_3 represents a hydrogen atom, said process comprising treating aminoaldose, or a mixture of 2 aminoaldoses, of general formula $CHO-CH(NH_2)-R_1$ (XI) in which R_1 has the same meaning as in claim 3, isolating the product and optionally converting it to a salt with an inorganic or organic acid.

9. The process according to claim 8 in which said aminoaldose is D-galactosamine.

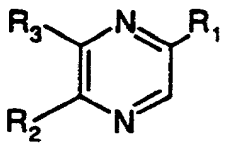
10. A process for the preparation of a compound according to claim 3 in which R_1 of formula (I) represents the stereoisomeric forms of the $-(CHOH)_3-CH_2OH$ chain (II), R_2 represents the stereoisomeric forms of the $-CH_2-(CHOH)_2-CH_2OH$ chain (III) and R_3 represents a hydrogen atom, said process comprising treating an aminoaldose, or a mixture of two aminoaldoses of general formula $CHO-CH(NH_2)-R_1$ (XI), in which R_1 has the same meaning as in claim 3, in acidic medium, isolating the product and optionally converting it to a salt with an inorganic or organic acid.

11. A process according to claim 10 in which said aminoaldoses or mixture of aminoaldoses comprises D-galactosamine.

12. A process for the preparation of a compound according to claim 3 in which R_1 of formula (I) is a stereoisomeric form of $-(CHOH)_3-CH_2OH$ chain (II), R_2 is a stereoisomeric form of $-CH_2-(CHOH)_2-CH_2OH$ chain (III) and R_3 is a hydrogen atom, said process comprising reacting a ketose, or a mixture of two ketoses, of general formula $HOCH_2-CO-R_1$ (XII) in which R_1 has the same meaning as in claim 3, with ammonium formate and isolating the product and optionally converting the product to a salt with an inorganic or organic acid.

13. A process according to claim 12 wherein said ketose of formula (XII) is selected from D-psicose, D-sorbose, D-tagatose, L-psicose, L-fructose, L-sorbose and L-tagatose.

14. A method for the treatment or prevention of diabetes or complications of diabetes, this method comprising administering to a patient in need of such treatment an effective amount of a compound of formula (I)



(I)

in which

R_1 is any of the stereoisomeric forms of the chain

$-(CHOH)_3-CH_2OH$ (II)

and

either (A) R_2 is a hydrogen atom and R_3 is any of the stereoisomeric forms of the chain

$$-CH_2-(CHOH)_2-CH_2OH \qquad (III)$$

or (B) R_2 is any of the stereoisomeric forms of the chains

$$-(CHOH)_3-CH_2OH \qquad (II)$$

and

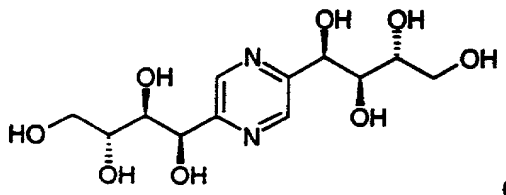
$$-CH_2-(CHOH)_2-CH_2OH \qquad (III)$$

and R_3 is a hydrogen atom,

or their salts with an inorganic or organic acid, in a pharmaceutically acceptable vehicle,

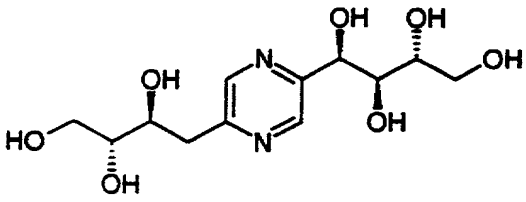
provided, however, that said compound is not

- fructosazine of formula



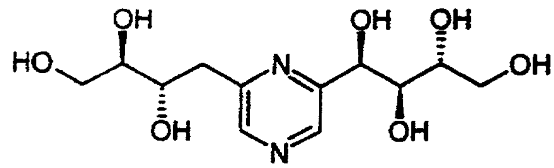
(IV), or

- deoxyfructosazine of formula



(V), or

- a compound of formula



(VI) .